

Introductory Remarks to Symposium 29

To eat? To sleep? To run? Coordination of innate behaviors by hypothalamic circuits

Tatiana Korotkova and Antoine Adamantidis, Berlin and Bern (Switzerland)

Hypothalamus is crucial for the regulation of innate behaviors, including food intake, sleep and arousal. Pathologies of hypothalamus lead to widely spread sleep and eating disorders. In this symposium the speakers will present their latest results on functions of genetically-defined hypothalamic circuits and on their role in the initiation, maintenance and coordination of multiple vital functions. They will also highlight how dysfunctions of hypothalamic circuitries may contribute to obesity and sleep disorders. J. Brüning will present his work focusing on the identification and functional characterization of melanocortin-dependent neurocircuits, which control peripheral insulin sensitivity and glucose homeostasis. He will further discuss how melanocortin neurocircuits adapt food intake and energy expenditure according to fuel ability, as well as coordinate the fluxes of fuels across different organs. A. Adamantidis will describe a role of GABA cells in lateral hypothalamus (LH) and their projections to TRN (reticular thalamic nucleus) in sleep-wake states. Optogenetic activation of LHGABA-RTN circuit induces rapid arousal during NREM sleep, as well as sustained cortical arousal during deep anesthesia. D. Burdakov will lecture on distinct connectivities and dynamics of GABA, orexin and MCH-expressing LH cells. He will present his data on probing of circuit architecture and behavior-related natural signals of different LH neuronal groups and will discuss how it reveals circuit processing rules in LH. T. Korotkova will describe the role of gamma oscillations, coordinated between medial prefrontal cortex, lateral septum and LH, in regulation of feeding behavior. Gamma-rhythmic signaling in this pathway enables separate signaling by LH neurons according to their feeding-related activity, facilitates food-seeking and improves performance in a food-rewarded learning task.

Altogether, this symposium will highlight functional organization of major hypothalamic circuits and thus gain insights into neural basis of behaviors crucial for survival.

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Symposium 29

*Friday, March 24, 2017
14:30 - 16:30, Lecture Hall 102*

*Chair: Tatiana Korotkova and Antoine Adamantidis,
Berlin and Bern (Switzerland)*

- 14:30 **Opening Remarks**
- 14:40 Jens Brüning, Cologne
CNS-DEPENDENT REGULATION OF GLUCOSE HOMEOSTASIS (S29-1)
- 15:00 Antoine Adamantidis, Bern, Switzerland
THALAMIC INTEGRATION OF LH CIRCUITS IN SLEEP-WAKE STATES (S29-2)
- 15:20 Denis Burdakov, London, UK
INHIBITORY INTERPLAY BETWEEN OREXIN/HYPOCRETIN NEURONS AND EATING (S29-3)
- 15:40 Tatiana Korotkova, Berlin
GAMMA OSCILLATIONS ORGANIZE TOP-DOWN SIGNALING TO HYPOTHALAMUS AND ENABLE FOOD SEEKING (S29-4)
- 16:00 Gretel Betiana Kamm, Heidelberg
THE TRPM2 CHANNEL IS A HYPOTHALAMIC HEAT SENSOR THAT LIMITS FEVER AND CAN DRIVE HYPOTHERMIA (S29-5)
- 16:10 Stefan Hirschberg, Bristol, UK
RETROGRADE CHEMOGENETIC DISSECTION OF THE CENTRAL NORADRENERGIC SYSTEM: IMPLICATIONS FOR ANALGESIC AND AVERSIVE NEURONAL CIRCUITS (S29-6)
- 16:20 **Concluding Remarks**